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school, the volume is rich alike in fine theoretical considerations and in varied applications. Theory, however, is not overdone, and the applications are chosen with unusual regard to their intelligibility.

C. J. KEYSER

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Instinct and Experience. By C. LLOYD MORGAN, Professor in the University of Bristol. New York, The Macmillan Company. 1912. Pp. xvii + 299.

"Once more I urge that the more clearly we distinguish the scientific problems from the metaphysical problems the better it will be both for science and for metaphysics" (p. 292). This, the concluding sentence of Professor Morgan's book, suggests the tenor of his discussion.

The volume is the direct outcome of a symposium on instinct and intelligence which was held in London in the summer of 1910. The several papers contributed to the symposium were published in the *British Journal of Psychology*, Vol. 3, 1909-10. Professor Morgan's views concerning instinct and intelligence differed in many respects from those of certain of the other speakers, and in the present work he has, at some length, presented and defended them in contrast with those of Messrs. Myers, McDougall and Stout.

Although the author would doubtless resent the suggestion, the reviewer looks upon this work as philosophical rather than purely scientific in nature. It deals largely with definitions, relations, speculations and presuppositions, and with attempts to draw a line between the naturalistic and the metaphysical disciplines. This is undoubtedly a profitable task from Professor Morgan's standpoint, but from the reviewer's it is decidedly less profitable than attempts to supply the deficiencies in our knowledge of instinct and intelligence.

And yet Professor Morgan insists, even in his opening paragraph, "My aim is to treat the phenomena of conscious existence as a naturalist treats the phenomena of organic life. I shall therefore begin with instinctive behavior and shall endeavor to give some ac-

count of the nature of the instinctive experience which, as I believe, accompanies it. In this way we shall get some idea of what I conceive to be the beginnings of experience in the individual organism" (p. 1). From this statement, one might suppose that the book would be devoted chiefly to the phenomena of instinctive and intelligent behavior, rather than to a consideration of the relations of instinct and experience or of the necessity of avoiding metaphysical problems.

Resting his contention upon the physiological discoveries of Sherrington and his co-workers, Professor Morgan insists that we must, in the end, distinguish instinctive from intelligent activities by describing the changes which occur in the central nervous system. The instinctive is dependent upon subcortical processes; and the intelligent, by contrast, is dependent upon cortical processes.

Throughout the book, but especially in Chapters II., The Relation of Instinct to Experience, III., Reflex Action and Instinct, and IV., Hereditary Dispositions and Innate Mental Tendencies, the importance of studying the functions of the central nervous system in their relations to different forms of activity is emphasized.

Effective consciousness, by which the author means consciousness that has something to do with the form of behavior, is supposed to be "connected with the process of profiting by experience" and to be "correlated with" the functions of the cerebral cortex. There is every reason, the author contends, to attempt to write a natural history of effective consciousness, a natural history of experience "as it somehow actually runs its course."

Concerning the doctrine of epiphenomenalism, the author observes that we have no proof whatever that the same brain processes which occur in connection with intelligent activity, accompanied by consciousness, ever occur in precisely the same way when these accompaniments are lacking. Professor Morgan does not believe that behavior would remain the same if the cerebral processes occurred without "correlated intelligence" (p. 262).

At the very beginning of life, inherited mechanisms are set going by appropriate situations. The reaction complex is instinctive. But immediately, if the organism possesses a cortical mechanism, profiting by reaction commences and each new performance, each new response to a given situation, in some measure modifies the creature, and by adding to its sum of experience, renders it more intelligent. Professor Morgan does not seriously discuss the question of whether intelligence or experience may exist in organisms which do not possess a cerebral cortex.

The author's conception of the relation between instinct and emotion is thus stated: "When a specific situation affords an appropriate constellation of stimuli, there issue reflexly from the subcortical centers two sets of efferent impulses, (1) those which evoke a specific mode of instinctive behavior, including those motor responses which constitute much of the so-called emotional expression; (2) those which evoke visceral disturbance—changes of heart-beat, and of the respiratory rhythm, modifications of the digestive and glandular functions, alterations in the peripheral vascular flow, a diffused influence on the general *cœnæsthesia* and so forth. From all this complex of bodily changes under (1) and (2) afferent impulses come into the central nervous system, and, when they reach the cortex, qualify the experience of the presented situation and thus complete the instinctive experience with its accompanying emotional tone. I regard it as probable that, in its primary genesis, the emotional tone is in large measure correlated with the cortical disturbance due to stimulation which is visceral and *cœnæsthetic* in origin" (p. 112).

In the final chapters of the book, VII., *The Philosophy of Instinct*, and VIII., *Finalism and Mechanism: Body and Mind*, Professor Morgan offers a critique of the views of Mr. Bergson, together with comments on those of Messrs. Myers, McDougall and Driesch.

The book is clearly and persuasively written and will undoubtedly prove agreeably profitable to readers who approach it as a general

philosophical discussion of the subject, rather than as a contribution to the science of behavior. The reviewer's sole objection to the discussion is that it meets no urgent need.

R. M. YERKES

Glycosuria and Allied Conditions. By P. J. CAMMIDGE, M.D.

The increase which has occurred within the past decade or so in the number of cases of glycosuria—an increase which is only in part due to refinements of diagnosis—is demanding the attention of a large number of investigators as to the causes which give rise to this condition.

Although the milder degrees of glycosuria are not associated with the other well-known symptoms of diabetes, yet the latter are liable gradually to develop unless great care and judgment be used in controlling the diet of the patient. To do this efficiently the physician must familiarize himself with the more strictly scientific work bearing on the history of carbohydrates in the animal body, and it comes to be of importance that for this purpose he should be able to procure reliable and up-to-date reviews of the work that has been done.

In the present volume, from the pen of a clinical worker, a praiseworthy account is offered of much of the recent work—both clinical and experimental—bearing on the causes and treatment of various degrees of glycosuria. It is, however, more particularly with the part of the book bearing on the purely scientific aspect of the problem that the present review is concerned.

In the first chapter the general chemical properties and relationships of the various carbohydrates are sufficiently explained for most purposes, greater details being offered in the form of an appendix. Too little attention is, however, given to the condition of carbohydrates in the blood, an omission which, in view of the large amount of recent important investigation, is rather disappointing. The statement on page 17 that the blood is of definite alkalinity is hardly in keeping with modern teaching.